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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/759,480	01/16/2004	Jaiganesh Balakrishnan	TI-35863	7576

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EXAMINER	
BENGHUZZI, MOHSIN M	
ART UNIT	**PAPER NUMBER**
2611	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/759,480	BALAKRISHNAN ET AL.	
	Examiner	Art Unit	
	Mohsin (Ben) Benghuzzi	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,8,9 and 20-32* is/are rejected.

7)☒ Claim(s) *4-7 and 10-19* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *16 January 2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ulupinar et al. (US Pub 2004/0008757) in view of Shen et al. (US 5,640,698).

1) Regarding claim 1:

Ulupinar et al. disclose an ultra-wideband receiver comprising:

an amplifier coupled to the filter, the amplifier to bring the passed signals to a signal level compatible with circuitry in the receiver (222 in Fig. 2 and paragraph 0022, lines 7-8);

a demodulating unit coupled to the amplifier, the demodulating unit containing circuitry to bring the passed signals to an internal frequency (226 in Fig. 2 and paragraph 0022, lines 9-10);

a converter coupled to the timing generating unit, the converter to convert continuous samples produced by the timing generating unit into discrete samples (228 in Fig. 2 and paragraph 0022, lines 11-12).

Ulupinar et al. do not disclose:

a filter coupled to a signal input, the filter to pass signals in a frequency band from a received signal provided by the signal input;

a timing generating unit coupled to the demodulating unit, the timing generating unit containing circuitry to generate samples of the passed signals at different timing offsets.

However, Shen et al. disclose a receiver comprising:

a filter coupled to a signal input, the filter to pass signals in a frequency band from a received signal provided by the signal input (75 in Fig. 4 and column 4, lines 50-51);

a timing generating unit coupled to the demodulating unit, the timing generating unit containing circuitry to generate samples of the passed signals at different timing offsets (column 5, lines 7-11, wherein, the 'sample-and-hold circuit 81' is interpreted as the timing generating unit. Examiner interprets the claimed timing generating unit to be a sample/hold circuit, as disclosed in the instant specification, paragraph 0045, lines 3-6).

It is essential that a front-end filter, i.e., RF filter, be placed in a receiver immediately after the antenna. Such filter is needed to allow only the selected frequency band pass through and block frequencies from neighboring bands, thus, eliminating interference. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include in the receiver of Ulupinar et al. a filter coupled to the signal input, as Shen et al. teach, in order to be able to eliminate interference.

Regarding the timing generating unit, it is well know in the art that a sample-and-hold circuit is needed prior to an analog-to-digital converter. An instant value of an analog signal must first be sampled and held, followed by the generation of a discrete sample for that instant analog value.

2) Regarding claim 2:

Ulupinar et al. disclose a receiver wherein the demodulating unit further contains circuitry to provide in-phase and quadrature phase signal streams from the passed signals (paragraph 0022 lines 9-15).

3) Regarding claim 8:

Shen et al. discloses a receiver comprising an interference mitigating circuit having an input coupled to the amplifier and an output coupled to the demodulator (column 7 line 66 to column 8 line 18), the interference mitigating circuit comprising:

a down-conversion unit to bring an interference band within the received signal down to baseband (column 7 line 67 to column 8 line 2); and

a high-pass filter coupled to the down-conversion unit, the high-pass filter to eliminate the interference band located at baseband (column 8 lines 5-7).

4) Regarding claim 9:

Ulupinar et al. or Shen et al. do not specifically disclose an interferer located within a frequency band of 5.15 GHz to 5.85 GHz, wherein the mixer carrier frequency is approximately 5.5 GHz, and wherein the high-pass filter has a cutoff frequency at approximately 350 MHz, such limitation is merely a matter of design choice and would have been obvious in the system of Ulupinar et al. and Shen et al. Depending on the

initial location of the interferer frequency band, the carrier frequency should be chosen so that once mixing is complete, i.e., once the interferer is down-converted, the interfere frequency band is lower than the cutoff frequency of the high-pass filter and, thus, resulting in the mitigation of the interferer.

Regarding the down-conversion unit being a mixer, Shen et al. disclose a down-conversion unit that is a mixer (column 2, lines 44-51).

3. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ulupinar et al. (US Pub 2004/0008757) and Shen et al. (US 5,640,698), and further in view of Kazakevich et al. (US Pub 2002/0012409).

Ulupinar et al. or Shen et al. do not disclose, wherein the demodulating unit further contains amplifiers to variably adjust the gain of the in-phase and quadrature phase signal streams. However, Kazakevich et al. disclose a receiver wherein the demodulating unit further contains amplifiers to variably adjust the gain of the in-phase and quadrature phase signal streams (paragraph 0007, lines 2-8, wherein, the 'AGC circuit' is clearly interpreted as the variable adjustable gain unit).

It is desirable that the gain for the I and Q signal streams is variably adjusted. Such adjustment keeps the output of the demodulator within a linear operating region (see Kazakevich et al. paragraph 0007, lines 6-8). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include, in the demodulating unit of Ulupinar et al. and Shen et al., variably adjusted amplifiers,

as Kazakevich et al. teach, in order to keep the demodulating unit within its linear operating region.

4. Claims 20 and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raphaeli et al. (US 6,616,254) in view of Kim et al. (US RE38,603).

1) Regarding claim 20:

Raphaeli et al. disclose a transmitter comprising:

an encoding unit coupled to a data source, the encoding unit containing circuitry to apply a code to data provided by the data source (column 3, lines 44-45 and 28 in Fig. 5);

a spreading unit coupled to the encoding unit, the spreading unit containing circuitry to apply a spreading code to the data (column 1, lines 51-55 and column 7, lines 59-61);

a pulse shaping unit coupled to the spreading unit, the pulse shaping unit containing circuitry to apply mask of a desired pulse with desired frequency characteristics to the encoded and spread data (column 4, lines 18-21, wherein, the 'filter' is interpreted as the pulse shaping unit, and 'to spectrally shape' is interpreted as applying mask of desired frequency characteristics);

a modulating unit coupled to the pulse shaping unit, the modulating unit apply a carrier frequency to the shaped, encoded, and spread data (column 7, lines 43-47).

Raphaeli et al. do not disclose a filter coupled to the modulating unit, the filter to ensure that the modulated, shaped, encoded, and spread data fit within a desired

frequency range. However, Kim et al. disclose a filter to ensure that the data fit within a desired frequency range (column 5, lines 7-8 and 110 in Fig. 1).

It is essential that a signal be passed through a filter before transmission. Limiting the signal with the use of a filter prevents the signal from interfering with neighboring frequency bands. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a filter, as Kim et al. teach, in the receiver of Raphaeli et al., in order to prevent the signal from interfering with neighboring frequency bands.

2) Regarding claim 22:

Raphaeli et al. discloses the spreading unit multiplies the data with a spreading code with a specified spreading gain (column 1, lines 53-55, wherein, 'a signal having particularly desirable spectral properties' is interpreted as with a specified spreading gain).

Regarding a spreading code with a specified spreading gain, it is well known in the art that each spreading signal has its own spreading gain.

3) Regarding claim 23:

Raphaeli et al. or Kim et al. do not specifically disclose the spreading code has a period that is larger than the specified spreading gain, however, it is the nature of spread spectrum technology that the spreading code has a period that is larger than the specified spreading gain. In order for the signal resulting from multiplication with a spread spectrum sequence to have a wider bandwidth than its original counterpart, the

spread spectrum sequence period, i.e., the spreading code period must be larger than the specified spreading gain.

4) Regarding claim 24:

Raphaeli et al. or Kim et al. do not specifically disclose the spreading code period is significantly larger than the specified spreading gain, however, it is well known in the art that the larger the spreading code period is, the larger the bandwidth for the resultant spread signal, i.e., the larger the spreading code period is, the more spreading obtained and, thus, the more effective the system is.

5. Claims 21, 25, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raphaeli et al. (US 6,616,254) and Kim et al. (US RE38,603), and further in view of Grimwood et al. (US Pub 2001/0033611).

1) Regarding claim 21:

Raphaeli et al. or Kim et al. do not specifically disclose, wherein the encoding unit is a convolutional encoder. However, Grimwood et al. discloses (paragraph 0231, lines 3-5).

It is advantageous that an encoder be a convolutional encoder. Convolutional encoders are easy to implement, have low system latency, and require very low power for operation. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the encoding unit of Raphaeli et al. and Kim et al. be a convolutional encoder, as Grimwood et al. teaches, in order to result in an

encoding unit that is easy to implement, have low system latency, and require very low power.

2) Regarding claim 25:

Raphaeli et al. disclose the pulse shaping unit comprises, a filter coupled to the sampler, the filter having a frequency response of the desired pulse (column 4, lines 18-19, wherein, 'to spectrally shape' is interpreted as the filter having a frequency response of the desired pulse).

Grimwood et al. discloses a sampler to upsample the encoded and spread data by a specified amount (paragraph 0238, lines 7-9).

3) Regarding claim 26:

Grimwood et al. discloses the filter has the frequency response of a square-root raised cosine (SRRC) pulse (paragraph 0238, lines 4-5).

6. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ulupinar et al. (US Pub 2004/0008757), Shen et al. (US 5,640,698), Raphaeli et al. (US 6,616,254), Kim et al. (US RE38,603), and further in view of McCorkle (US Pub 2002/0064245).

As discussed in claim 1 above, Ulupinar et al. disclose a device comprising:

a receiver coupled to the switch, the receiver comprising

an amplifier coupled to the filter, the amplifier to bring the passed signals to a signal level compatible with circuitry in the receiver (222 in Fig. 2 and paragraph 0022, lines 7-8);

a demodulating unit coupled to the amplifier, the demodulating unit containing circuitry to bring the passed signals to an internal frequency (226 in Fig. 2 and paragraph 0022, lines 9-10);

a converter coupled to the timing generating unit, the converter to convert continuous samples produced by the timing generating unit into discrete samples (228 in Fig. 2 and paragraph 0022, lines 11-12).

Ulupinar et al. do not disclose:

a filter coupled to the switch, the filter to pass signals in a frequency band from a received signal provided by the signal input;

a timing generating unit coupled to the demodulating unit, the timing generating unit containing circuitry to generate samples of the passed signals at different timing offsets.

However, as discussed in claim 1 above, Shen et al. disclose a receiver comprising:

a filter coupled to the switch, the filter to pass signals in a frequency band from a received signal provided by the signal input (75 in Fig. 4 and column 4, lines 50-51);

a timing generating unit coupled to the demodulating unit, the timing generating unit containing circuitry to generate samples of the passed signals at different timing offsets (column 5, lines 7-11, wherein, the 'sample-and-hold circuit 81' is interpreted as the timing generating unit. Examiner interprets the claimed timing

generating unit to be a sample/hold circuit, as disclosed in the instant specification, paragraph 0045, lines 3-6).

Regarding the timing generating unit, it is well know in the art that a sample-and-hold circuit is needed prior to an analog-to-digital converter. An instant value of an analog signal must first be sampled and held, followed by the generation of a discrete sample for that instant analog value.

As discussed in claim 20 above, Raphaeli et al. disclose a device comprising a transmitter coupled to the switch, the transmitter comprising

an encoding unit coupled to a data source, the encoding unit containing circuitry to apply a code to data provided by the data source (column 3, lines 44-45 and 28 in Fig. 5);

a spreading unit coupled to the encoding unit, the spreading unit containing circuitry to apply a spreading code to the data (column 1, lines 51-55 and column 7, lines 59-61);

a pulse shaping unit coupled to the spreading unit, the pulse shaping unit containing circuitry to apply mask of a desired pulse with desired frequency characteristics to the encoded and spread data (column 4, lines 18-21, wherein, the 'filter' is interpreted as the pulse shaping unit, and 'to spectrally shape' is interpreted as applying mask of desired frequency characteristics);

a modulating unit coupled to the pulse shaping unit, the modulating unit to apply a carrier frequency to the shaped, encoded, and spread data (column 7, lines 43-47).

Raphaeli et al. do not disclose a filter coupled to the modulating unit, the filter to ensure that the modulated, shaped, encoded, and spread data fit within a desired frequency range. However, as discussed in claim 20 above, Kim et al. disclose a filter to ensure that the data fit within a desired frequency range (column 5, lines 7-8 and 110 in Fig. 1).

Ulupinar et al., Shen et al., Raphaeli et al., or Kim et al. do not disclose:

an antenna to transmit and receive signals;

a switch coupled to the antenna, the switch to control access to the antenna.

However, McCorkle discloses a device comprising:

an antenna to transmit and receive signals (505 in Fig. 5);

a switch coupled to the antenna, the switch to control access to the antenna (510 in Fig. 5).

It is clearly obvious that it is necessary that a transmitter/receiver have an antenna. Furthermore, it would have to one of ordinary skill in the art that a switch is needed to select the antenna to be either operating in a transmission mode or in a reception mode. For proper transmission and reception, an antenna cannot operate simultaneously in both transmission and reception mode.

7. Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ulupinar et al. (US Pub 2004/0008757), Shen et al. (US 5,640,698), Raphaeli et al.

(US 6,616,254), Kim et al. (US RE38,603), and McCorkle (US Pub 2002/0064245), and further in view of Grimwood et al. (US Pub 2001/0033611).

1) Regarding claim 28:

Ulupinar et al., Shen et al., Raphaeli et al., Kim et al., or McCorkle do not disclose, wherein the desired pulse is a square-root raised cosine (SRRC) pulse, however, as discussed in claim 26 above, Grimwood et al. discloses a device wherein the desired pulse is a square-root raised cosine (SRRC) pulse (paragraph 0238, lines 4-5).

2) Regarding claim 29:

Grimwood et al. do not specifically disclose the SRRC pulse has a frequency bandwidth that is a fraction of available ultra-wideband bandwidth, however, it is clearly obvious to those of ordinary skill in the art that the pulse bandwidth must be a fraction of available ultra-wideband bandwidth, i.e., must be less than the available ultra-wideband bandwidth. If the pulse bandwidth is greater, interference is then caused by some pulse frequency spilling over onto the unavailable bandwidth.

8. Claims 30-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ulupinar et al. (US Pub 2004/0008757), Shen et al. (US 5,640,698), Raphaeli et al. (US 6,616,254), Kim et al. (US RE38,603), McCorkle (US Pub 2002/0064245), and further in view of Roberts (US Pub 2006/0166619).

1) Regarding claim 30:

Ulupinar et al., Shen et al., Raphaeli et al., Kim et al., or McCorkle do not disclose, wherein the device avoids transmitting in frequency bands of known interferers. However, Roberts discloses, wherein the device avoids transmitting in frequency bands of known interferers (paragraph 0170, lines 3-8).

It is essential that a device avoid transmitting in frequency bands of known interferers. It is clearly obvious that transmitting in frequency bands of known interferers results in interference. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to avoid transmitting in frequency bands of known interferers, as Roberts teaches, in order to prevent signal interference.

2) Regarding claim 31:

Roberts discloses, wherein the device transmits in the frequency bands of known interferers when they are absent (paragraphs 0172 and 0173).

3) Regarding claim 32:

Roberts discloses, wherein the device transmits in a portion of available ultra-wideband bandwidth, and wherein when multiple ultra-wideband devices are present, each ultra-wideband device can transmit in a different portion of the ultra-wideband bandwidth (paragraph 0174, wherein, 'two or more bands' is interpreted as different portions of the ultra-wideband bandwidth).

Allowable Subject Matter

9. Claims 4-7 and 10-19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record fails to clearly teach or suggest a receiver with a timing generating unit comprising a pair of sample/hold circuits receiving an I and a Q signal streams, wherein the first sample/hold circuit produces an on-time sample and the second sample/hold circuit produces an early and a late sample. The prior art of record also fails to clearly teach or suggest a receiver comprising a pair of ADC converters with the first having higher resolution than the second. The prior art of record also fails to clearly teach or suggest a receiver of claim 1 comprising a baseband circuit with an adjust timing circuit coupled to a despreader, wherein the adjust timing circuit controls sampling of an ADC.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Myosin (Ben) Bbenghuzzi whose telephone number is (571) 270-1075. The examiner can normally be reached Monday through Friday, 8:30am- 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Glamour can be reached on (571) 272-3021. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

11. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Myosin (Ben) Bbenghuzzi

March 28, 2007

MOHAMMED GHAYOUR
SUPERVISORY PATENT EXAMINER